



- **Board of Directors**
Water Planning and Resources Committee

February 8, 2000 Board Meeting

10-6

Subject

Integrating Metropolitan's Seawater Desalination Activities

Description

Metropolitan has explored the potential of seawater desalination as a water supply for Southern California over the past several decades. In 1995, the Board adopted a policy that established a lead role for Metropolitan in the development and demonstration of seawater desalination.

Since 1990, Metropolitan has conducted research in seawater desalination technology. This effort recently culminated in the completed design of a generic Vertical-Tube-Evaporation Multiple-Effect-Distillation (VTE-MED) plant by Parsons Overseas Company and Israel Desalination Engineering (Parsons/IDE). This effort was jointly funded by Metropolitan and the U.S./Israel Science and Technology Foundation. In 1998, Metropolitan also purchased property at Ormond Beach in Ventura County that could serve as a future desalination plant site. These efforts have been prompted by the impacts of periodic droughts, investigations into diversifying conventional water supply and public interest in tapping the Pacific Ocean as a limitless source of drinking water.

To date, high costs and environmental concerns have distinguished seawater desalination opportunities from traditional, more cost-competitive resource options. As part of the 1996 Integrated Resource Plan (IRP), Metropolitan evaluated the cost of seawater desalination and excluded it as a supply element at least through 2020. However, recent advances in reverse osmosis (RO) membrane technology are improving efficiencies to a point where seawater desalination may be more competitive within the foreseeable future.

Staff's initial assessment of seawater desalination is that it appears best suited for local development by communities bordering the Pacific Ocean, consistent with the water recycling and groundwater desalination components of the current IRP. Metropolitan is in a unique position to both assess the regional merits of seawater desalination as it updates its IRP and aid local agency decisions regarding development of new projects. Metropolitan could extend its valuable water quality treatment and engineering expertise to support technical assessments initiated by member agencies. Additionally, Metropolitan could leverage its research efforts by partnering with member agencies and others in programs similar to the existing Desalination Research and Innovation Partnership (DRIP) program which currently focuses on brackish groundwater, Colorado River water and reclaimed water.

Recently, the Board has considered policy principles as part of its strategic planning process. It is timely that Metropolitan review its role in seawater desalination as it finalizes its strategic plan over the next several months.

To accomplish this, staff will provide over the next several months an assessment of Metropolitan's investments and opportunities in seawater desalination, provide strategic planning implications, and propose options for Board consideration and action regarding the following items:

- Revised policy principles for seawater desalination.
- Disposition of Metropolitan's Ormond Beach property.
- Future activities related to VTE-MED technology.

- Proposed approach for further research efforts in seawater desalination.

In advance of discussion of those items, the following background materials are attached:

- Abbreviated Summary of Metropolitan's Involvement in Seawater Desalination ([Attachment 1](#)).
- Overview of Metropolitan's Ormond Beach property ([Attachment 2](#)).
- July 18, 1995 Board letter, "Adoption of Policy Statement and Principles for Seawater Desalination." ([Attachment 3](#)).

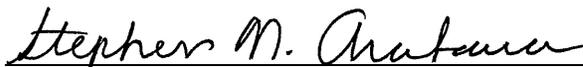
Policy

Prior Board direction provided by Board letter dated July 18, 1995.

Fiscal Impact

Status Quo. Under its currently adopted policy principles, Metropolitan could commit to capital-intensive research and demonstration of seawater desalination technology, the costs for which might be partially but not completely mitigated through public/private partnerships. Metropolitan could also commit to long-term retention of land it now owns for construction of a desalination plant at some undetermined future date. Metropolitan's proprietary rights, under the marketing agreement with the Parsons/IDE joint venture, might yield a revenue stream, depending upon future sales of the technology.

Revised Approach. A new approach for seawater desalination, in conjunction with the strategic plan, could define the relationship between Metropolitan, member agencies, and third parties for the research and development of this supply option, including financial participation by Metropolitan. Revising Metropolitan's policy principles to reflect this new approach would provide an integrated approach to previously undertaken activities such as the Parsons/IDE joint venture and the Ormond Beach property, as well as establish direction for future research and partnership efforts with member agencies and others. An integrated approach would ensure that Metropolitan's investments in seawater desalination are being made in a cost-effective manner.



Stephen N. Arakawa
Acting Manager, Water Resource Management

1/21/00

Date



General Manager

1/24/2000

Date

[Attachment 1](#)

[Attachment 2](#)

[Attachment 3](#)

Attachment 1

Abbreviated Summary of Metropolitan's Involvement with Seawater Desalination

1965-1968: Metropolitan and a consortium of the federal government and Southern California electric utilities entered into agreements to determine the feasibility of developing an off-shore nuclear power/desalination facility known as the Bolsa Island Project. The electric utilities withdrew after cost projections increased. Metropolitan and the federal government continued the investigation.

1974: Metropolitan purchased 82 acres of land adjacent to Bolsa Chica State Beach in Orange County for an access corridor to the potential Bolsa Island project. The concept was subsequently abandoned and the Metropolitan's land was sold in 1997.

1993-1995: Metropolitan joined Central Basin MWD, West Basin MWD, Southern California Edison (SCE), the City of Long Beach and the Water Replenishment District of Southern California to investigate the feasibility of developing a seawater desalination facility at an existing SCE power plant in coastal Los Angeles County. A feasible alternative was not identified and the study was suspended.

1990-1996: Metropolitan conducted research and preliminary design to develop an innovative seawater desalination technology that can be applied to large-scale applications. Included in this work was the construction and operation of a 2,000 gallon per day test unit at the SCE's Huntington Beach Power Plant. This test demonstrated operational features of the new Vertical-Tube-Evaporation Multiple-Effect-Distillation (VTE-MED) distillation process.

1993-1995: Metropolitan evaluated the cost of seawater desalination and excluded it as a supply element of its Integrated Resources Plan extending through the year 2020.

1995: Metropolitan adopted a policy to promote and lead in the research, development and demonstration of improved seawater desalination technologies.

1996-1998: Metropolitan and the U.S./Israel Science and Technology Foundation co-funded the joint venture of Parsons Overseas Company and Israel Desalination Engineering (Parsons/IDE) to design a generic, non-site specific 12.6 MGD demonstration-scale seawater desalination plant based on the VTE-MED technology.

1998: Metropolitan acquired a 50 percent interest in 309 acres at Ormond Beach near Oxnard, with 20 of the acres targeted as a potential seawater desalination site. The Community Development Commission of Oxnard owns the remaining 50 percent interest.

1999: Parsons/IDE begin worldwide commercialization activities for the new VTE-MED distillation seawater desalination technology under a currently open agreement with Metropolitan.

Attachment 2**Overview of Metropolitan's Ormond Beach Property**

The Ormond Beach property in Oxnard consists of approximately 309 acres and was purchased for \$10,200,000 in August 1998. Metropolitan owns an undivided 50 percent in this property with the Community Development Commission (CDC) of Oxnard as the 50 percent tenant-in-common. Metropolitan holds a note secured with a deed of trust for one-half the acquisition and due-diligence costs (\$5,212,081). The property currently generates \$87,000 annually via an agricultural land lease.

The Urban Land Institute recently completed its advisory study regarding strategies for optimizing land utilization in the Ormond Beach environs. Metropolitan and the CDC are analyzing this report for potential development of the property in conjunction with the larger Specific Plan area of 1,400 acres. The jurisdictional wetlands delineation maps/report are being finalized in order to determine the magnitude of useable acres.

Twenty (20) acres of the Metropolitan/CDC property has been designated for a desalination facility. The site is adjacent to the Ormond Beach Power Generating Station, which was recently sold by Southern California Edison to Houston Industries. An additional thirty (30) acres may be selected, at Metropolitan's sole option, during the next two years for further expansion purposes. Integration points for product water from a future desalination facility potentially include the City of Oxnard's proximate 45-inch main (20-mgd capacity) and the 39-inch Calleguas Oxnard-Santa Rosa Feeder (20-mgd capacity). At this point, Calleguas Municipal Water District, the most proximate member agency, has indicated no interest or need for this project.

Staff is continuing to evaluate numerous alternatives for desalination use of this land, including the following:

- pursue the establishment of a sea-water desalination plant
- sale of the property
- exchange/trade the property for another desalination site

In its feasibility analyses Metropolitan will also consider options for divestiture(s) of portions of the property, interim uses, and/or long-term revenue ground leases.

Attachment 3

APPROVED
by the Board of Directors of
The Metropolitan Water District
of Southern California
at its meeting held

41509

AUG 22 1995

Revised 8-6



MWD

METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

Karen E. Deak
EXECUTIVE SECRETARY

July 18, 1995

(Executive Committee--Action)
(Ad Hoc Committee on Energy and Desalination--Action)
(Committee on Legislation--Action)
(Engineering and Operations Committee--Action)

To: Board of Directors

From: General Manager

Subject: Adoption of Policy Statement and Principles for Seawater Desalination

RECOMMENDATION:

It is recommended that the Board adopt a seawater desalination policy statement and principles as stated in this letter.

John R. Wodraska
General Manager

Submitted by:

Gary M. Snyder
for Gary M. Snyder
Chief Engineer

Concur:

John R. Wodraska
for John R. Wodraska
General Manager

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(seawater.doc)

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July 18, 1995

SUMMARY:

A Board policy is needed to guide the staff's work on seawater desalination. Metropolitan is Southern California's lead agency in regional water development and may become a significant consumer of desalinated seawater in the next century. In the past, Metropolitan has supported non-controversial legislation pertaining to funding of desalination research and development. In 1990, the Board of Directors authorized the Seawater Desalination Demonstration Project and funds the project as each phase is evaluated. In May 1995, the Board of Directors passed "A Resolution in Support of Desalination Technology" which was included as part of a research and development grant application to the United States Department of Commerce. Metropolitan wishes to continue to participate with national and international organizations to lead and promote the demonstration of seawater desalination technologies. These activities may be in conjunction with the private or public sectors. Newly proposed projects will be evaluated on a case-by-case basis and presented to the Board of Directors on a continuing basis.

ISSUE

Metropolitan is Southern California's lead agency in regional water development and may become a significant consumer of desalination water in the next century.

Should Metropolitan continue to lead and coordinate seawater desalination activities and programs including the pursuit of legislation to fund research and demonstration?

BACKGROUND

For nearly forty years, Metropolitan and its Member Agencies have explored the viability of desalinating seawater. While more than adequate supplies of seawater are available and reliable, the costs to produce potable water using traditional desalting methods is far more costly than other existing sources.

There is significant world-wide interest for an economically feasible method to produce desalinated seawater. Desalination gained popularity in the 1990's as the public became keenly aware of drought and its environmental impact. In support of this work by both the public and private sectors, members of Congress have introduced legislation to provide research and development funding.

In keeping abreast with the technology in this arena, Metropolitan developed a conceptual design of an enhanced seawater distillation process. And in 1990, Metropolitan's Board of Directors authorized the exploration of a new, cost-competitive method of seawater desalination, The Seawater Desalination Demonstration Project. Funding is granted by the Board of Directors only after each phase of the project is evaluated and reviewed. A special Board Ad Hoc Committee on Energy and Desalination advises and monitors project activity.

The Seawater Desalination Demonstration Project is a three-phase program that includes preliminary engineering with a 2,000 gallon-per-day test unit, final design, and development and construction of a 5 million-gallon-per-day (mgd) demonstration plant. Total costs of this

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multi-year program are estimated at \$35 million. Thus far, Metropolitan has committed \$5 million to finance the costs of the preliminary design of the 5-mgd plant and for the design and construction of the 2,000 gallon-per-day test plant. This will serve as a prototype for a future, full-size 75 mgd plant.

Last May, Metropolitan pursued opportunities to help defray \$4 million of the remaining design costs of the demonstration plant through the use of research and development grant funds from the United States-Israel Science and Technology Program administered by the Department of Commerce. Metropolitan joined with the Ralph M. Parsons Company and the Israel Desalination Engineering Company in preparing a grant proposal which was submitted May 19.

METROPOLITAN POSITIONS

In the past, Metropolitan has supported non-controversial legislation pertaining to funding of desalination research and development technology.

Metropolitan has also encouraged member agencies to develop alternative sources of water through its Local Projects and Groundwater Recovery Programs and through such programs as the Central Basin Municipal Water District's Long Beach Desalination Project.

In support of Metropolitan's Seawater Desalination Demonstration Project, the Board of Directors adopted a "Resolution in Support of Desalination Technology" at its regularly scheduled meeting May 9, 1995. The adopted resolution states:

Whereas, Metropolitan meets supplemental water demands of 16 million people living in a six-county region of Southern California, is one of the largest water suppliers in the world, and is the lead agency in the region's integrated water resource planning and management efforts that include seawater desalination as a potential local water supply, and

Whereas, Metropolitan may become a significant consumer of desalinated seawater in the next century, it has an incentive to invest in developing cost-competitive technologies, and

Whereas, Metropolitan has analyzed seawater desalination projects throughout the world and has found that the actual costs of currently operating seawater desalination plants and the cost estimates for new seawater desalination plants are not cost-competitive with Southern California's traditional sources of water supplies, and

Whereas, in 1990 Metropolitan authorized the initiation of the Seawater Desalination Demonstration Project and has since committed \$5 million to complete the preliminary design of a large capacity seawater desalination facility that incorporates a new technology and to design, build, and operated a 2,000 gallon-per-day test unit which is currently in operation, and

Whereas, the Preliminary Design Report was completed in 1993, a test unit is now installed and preliminary test results of the new technology are very promising in producing cost-competitive drinking water,

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NOW THEREFORE, the Board of Directors of the Metropolitan Water District of Southern California does hereby resolve to:

PROVIDE FUNDS TO CONTINUE PURSUIT OF A NEW COST-COMPETITIVE SEAWATER DESALINATION TECHNOLOGY VERIFIED THROUGH THE DESIGN, CONSTRUCTION, AND OPERATION OF A 5-MILLION-GALLON-PER-DAY DESALINATION PLANT.

RECOMMENDED POLICY AND PRINCIPLES

It is recommended that the Board adopt the following policy and principles:

Policy

Metropolitan, in cooperation with national and international organizations, shall promote and lead in the development and demonstration of improved seawater desalination technologies. These activities and/or programs may be in conjunction with its member agencies and/or private and public sectors in order to provide additional, reliable potable water supplies to meet the projected demands of Southern California's growing population in the 21st century.

Principles

- 1) Metropolitan shall continue to play a leadership role in the research and demonstration of seawater desalination technology.
- 2) Metropolitan shall continue its effort to obtain research and development funding for projects from all external sources.
- 3) Metropolitan shall protect its intellectual property rights and install and maintain internal procedures to help ensure protection.
- 4) Metropolitan shall develop a broad coalition of public and private entities to share non-protected information, discuss opportunities and the transfer of technology, and to encourage the passage of legislation consistent with this policy.
- 5) Metropolitan staff shall evaluate each seawater desalination project proposal on its own merits, and submit an analysis with recommendations to the Ad Hoc Committee on Energy and Desalination.

With the adoption of this policy and principles, Metropolitan will continue to coordinate all related activities within its various divisions, departments and member agencies and ensure appropriate outreach to external participants.